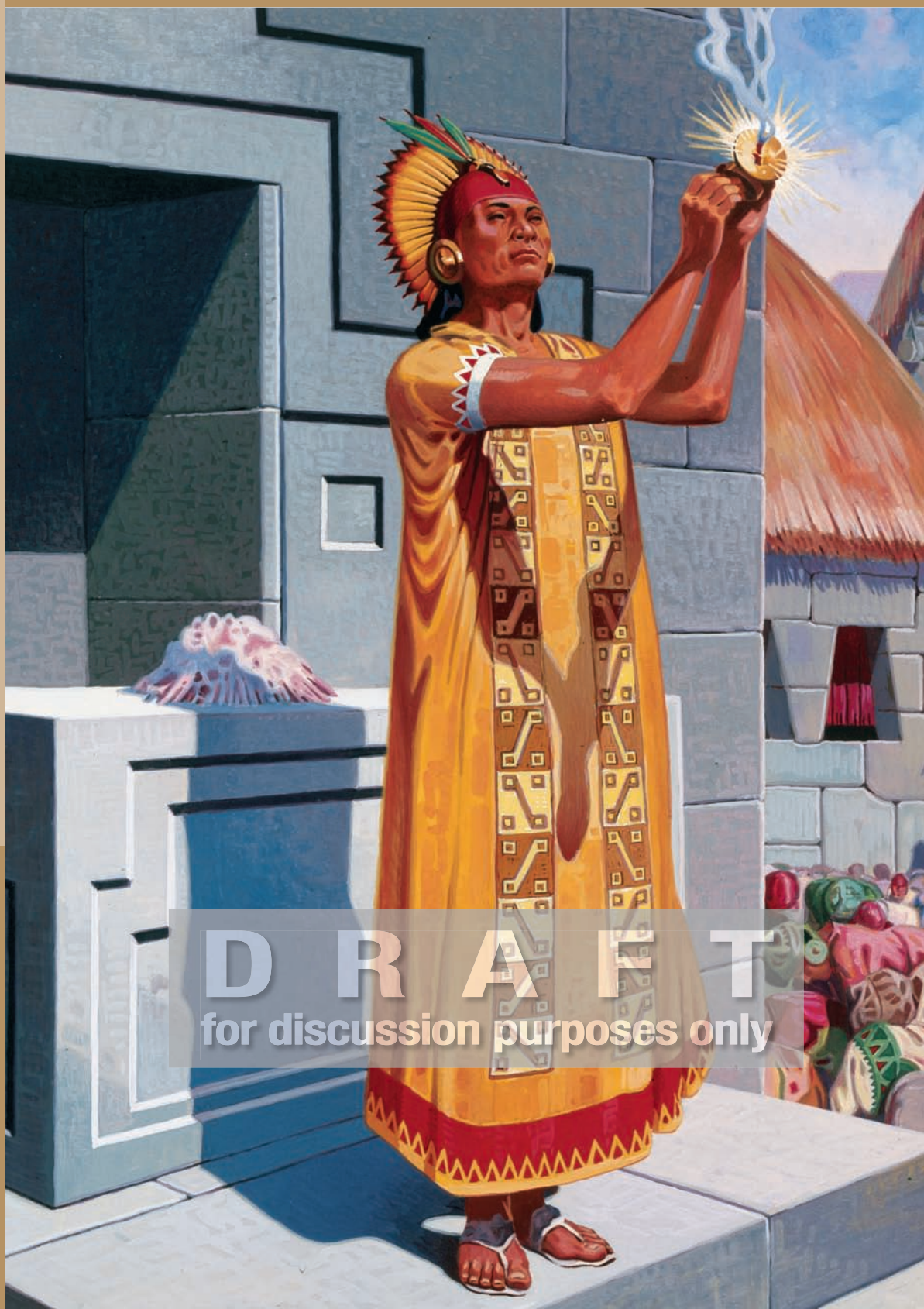


7

History-Social
Science Standard
7.7.1.



Sun Gods and Jaguar Kings

DRAFT

for discussion purposes only

California Education and the Environment Initiative

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Sun Gods and Jaguar Kings

Traditional Unit Assessment Master | page 1 of 5

Name: _____



Name: _____

1. Label Mexico, Central America, and South America on the map. (3 points)
2. Draw borders around and label the areas occupied by the Aztec, Maya, and Inca on the map.
(6 points: 1 point each for correct placement, 1 point each for correct labeling.)

Use the map to answer the following multiple choice questions. Select the best answer and circle the correct letter.
(1 point each)

3. The Aztec capital, Tenochtitlan, was located at:
 - a. A
 - b. B
 - c. F
 - d. E
4. The location with a climate similar to that of most of California is:
 - a. C
 - b. D
 - c. E
 - d. J
5. If you wanted to go catch large numbers of fish, the best place to fish would be:
 - a. B
 - b. G
 - c. I
 - d. H
6. The Maya city of Copan is closest to:
 - a. A
 - b. D
 - c. E
 - d. F
7. A place with a tropical wet climate is:
 - a. A
 - b. C
 - c. D
 - d. F
8. If you wanted to gather cochineal, you would go to:
 - a. C
 - b. D
 - c. E
 - d. J
9. If you were visiting F, you would probably want to pack:
 - a. snow boots
 - b. snorkel
 - c. machete
 - d. sand goggles
10. Which ecosystem good might you find at E?
 - a. potatoes
 - b. jade
 - c. vicuña wool
 - d. cochineal
11. What is the name of the landform feature at B?
 - a. Caribbean Sea
 - b. Lake Texcoco
 - c. Lake Atitlan
 - d. Lake Titicaca

Name: _____

12. Which ecosystem service is associated with I?
 - a. Air is forced over high mountains, cooling and condensing it into rain.
 - b. The Humboldt Current brings water north from Antarctica, carrying with it to the surface nutrients that support large fish populations.
 - c. The complex structure of coral provides many habitats for different species, fostering biodiversity.
 - d. Fresh water is concentrated by river valleys, making it accessible for human use.
13. Which ecosystem service is associated with C?
 - a. Plants bring water up from under the dry soil, making it available to animals and people.
 - b. Volcanic ash rains down on the soil, providing minerals for plant growth.
 - c. A low basin slows the flow of water and spreads it over the land, distributing nutrients over the landscape.
 - d. Mountains reach beneath the soil, creating large stores of fresh water underground.

Definitions

14. Choose five of the following terms and write a short definition of each. (5 points each)

climate	rain shadow	cacao	chia
quetzal	agricultural surplus	mit'a	tzompantli

[illegible]

Name: _____

Short Answer (10 points each)

15. How do the Andes Mountains affect the climates found in tropical South America?

16. What are at least two things we can learn from the Codex Mendoza regarding resource use by the Aztecs?

Name: _____

Fill in the Chart (1 point for each correct answer, total 15 points))

17. All three of the civilizations you have studied built major urban cities. In the table below, identify the capital city and provide examples of a geographical feature, the climate, and the types of resources available to each civilization that helped them build their cities.

	Maya	Aztec	Inca
Capital city			
Geographical features			
Climate			
Resources			
Who made decisions about the supply and use of resources that helped build the cities?			

Name: _____

1. Locate and label the following: (4 points each)

South America
Mexico
Central America
Pacific Ocean
Caribbean Sea

2. Locate and label 2 landforms for each of the three regions (5 points each)



Name: _____

Questions

Select one of the regions on your map and complete the following tasks.

3. Identify one of the landforms on your map. (5 points) _____

4. Describe the climate that is associated with the landform you identified. (5 points)

5. Identify an ecosystem in this area. (5 points)

6. Name one ecosystem good and a product made from this good that come from this area. (5 points)

7. Describe one ecosystem service that is important to this ecosystem. (5 points)

8. Who made the decisions about the supply and use of natural resources in the Aztec culture? (5 points)

9. What were the advantages of this decision-making process? (5 points)

10. What were the disadvantages of this decision-making process? (5 points)

11. Explain how knowing the geography and history of Latin America can help individuals and government agencies make decisions about the use of natural resources today. (10 points)

Abiotic: Related to the non-living components or factors such as, soil, water, precipitation, and temperature.

Amaranth: A plant grown throughout Latin America whose seeds are useful as a high protein grain.

Amber: Translucent yellow, orange, reddish or brown fossilized resin that is valued as a gemstone.

Biotic factors: Related to the living components, such as plants, animals and microbes, or factors within natural systems.

Boom: In economic terms, a rapid increase in growth or development.

Bust: In economic terms, a sudden, rapid financial collapse.

Cacao: A Central-American tree whose seeds are used to make cocoa and chocolate.

Cenote: A sinkhole or natural well in the limestone bedrock that facilitated access to the water table by the Maya.

Chia: A plant in the mint family whose seeds are edible and highly nutritious.

Climate: The prevailing, average weather conditions of a particular area over time.

Cochineal: A bright red dye made from the dried bodies of the small cactus-feeding cochineal insect that is found primarily in Mexico.

Copal: A hard resin derived from a variety of tropical trees that is used as incense and to make varnish.

Ecosystem: A specific area containing a characteristic set of interdependent species that interact with each other and the abiotic components found there.

Ecosystem goods: Tangible materials produced by natural systems that are essential to humans, our economies and cultures.

Ecosystem services: Functions and processes in natural systems that are essential to humans, our economies, and cultures.

Equator: An imaginary line equidistant from the poles and perpendicular to the axis of Earth's rotation.

Goods: Tangible materials important to human economies and cultures. (Note: goods may or may not be the result of natural processes.)

Landform: Any topographic features that makes up the earth's surface such as a plain, mountain, or valley.

Leeward: The direction downwind from a geographic feature or object such as a ship.

Loincloth: Strip of cloth worn around the waist and between the legs.

Maguëy: Desert agave plant that yields fiber and a sweet, honey-like syrup that can be distilled into tequila.

Meso-America: The area from central Mexico to northern Central America where pre-Columbian civilizations flourished.

Mit'a: Mandatory labor of Inca subjects that was often used for completing large public projects.

Montane: Pertaining to, growing in, or inhabiting mountainous regions.

Natural systems: The interacting, interrelated, and interdependent components, processes, cycles, and interactions among organisms and their habitats.

Nonrenewable resource: A natural resource, such as petroleum, that is not naturally replenished at a rate comparable to the rate of consumption.

Obsidian: A volcanic glass that can be used to make sharp knives and other tools.

Physical geography: The branch of Earth science that deals with features of Earth's surface, including land formations, climate, currents, and the distribution of plants and animals.

Pre-Columbian: Referring to the cultures of the New World in the era before significant European influence.

Progenitor: An ancestor or forefather in a direct line.

Quetzal: A Central-American bird known for its bright green and red feathers and the male's long tail feather.

Quinoa: A plant grown for its edible seeds that was an Inca food source in the Andes for 6,000 years.

Quolla: Inca storehouse.

Rain shadow: An area with little precipitation that lies on the leeward (downwind) side of a mountain.

Renewable resource: A natural resource, such as firewood, that can be replenished at a rate comparable to the rate of consumption.

Resource: Material such as soil, water, minerals, and energy reserves that natural systems produce and humans use.

Socialist system: An economic system in which the production and distribution of wealth is controlled by the government rather than private individuals and business.

Transect: A line or a strip of vegetation that cuts across a particular area, used for study purposes.

Tribute: 1. Money paid by one ruler or nation to another. 2. Any exacted or enforced payment.

Tropics: The region of the earth between the tropics of Cancer (23°27' N latitude) and Capricorn (23°27' S latitude).

Tzompantli: Aztec skull rack, displayed prominently to reinforce Aztec control over towns and provinces.

Weather: State of the atmosphere (temperature, moisture, wind and other atmospheric conditions) at a given time and place.

From Boom to Bust, California Ghost Towns

Part I: The Wild West



Many people still associate California with the Wild West. They remember the rough frontier and the promise of wealth that drew cowboys and fortune hunters. Television and movie Westerns keep these memories strong. These shows continue to be popular, glamorizing this era more than 50 years after the gold rush.

What is the truth behind the glamour of these so-called wild places? Some of them grew rich quickly (boomed), went broke quickly (busted), and then left their abandoned corpses as ghost towns. How did the way people used resources seal the fates of these towns?

Two ghost towns tell the story. Bodie, located high in the eastern Sierra, promised riches that outweighed its bleak climate. China Camp, a village founded in the 1870s in the mild climate of San Francisco Bay, held its own proverbial goldmine in the form of shrimp. The fates of these two towns closely resembled each other, despite the towns' many differences.

Bodie Boom

The town of Bodie sprouted in a treeless scrubland at 8,375 feet (2,553 meters), where the peaks of the eastern Sierra rise sharply from the high desert of eastern California. Until the 1800s, the dry, cold climate and rugged landscape supported only small numbers



Bodie State Park

of nomadic Northern Paiute Indians. But the geologic forces that created the unique landscape also exposed a mineral so valuable that settlers flocked to this harsh land: gold.

Although gold was first discovered in Bodie in 1859, it was not until 1875 that a cave-in exposed ore and attracted San Francisco



Drawing of China Camp children

investors who fueled the town's growth. With the financial backing in place for the costly operations needed to extract the ore, Bodie boomed. The Standard Mining Company began massive mining operations, and earned more than \$784,000 from gold and silver in 1877 (approximately \$446,000,000 in 2008 dollars). This bonanza drew hundreds of prospectors, especially as reports spread that ore gushed from a gigantic vein. Early luck led to overly optimistic and ever-bigger investments.

With a single industry at the base of its economy, Bodie developed into a gamble. Certain goods needed to support mining did not exist in the local ecosystem; for example, townsfolk needed wood for construction, mineshaft beams, and heating, but Bodie had few trees. The Bodie and Benton Railway formed in 1881 just to bring in lumber.

Despite the lack of local resources, many services developed to support people in the growing city. Bodie became known as a brash town full of saloons and gambling halls. The real-life version of a Western movie, behavior in Bodie resulted in many shoot-outs and near daily body counts.

Growth of China Camp

Many former Chinese railroad workers, originally brought to the U.S. because they represented “cheap” labor, found themselves out of work after the gold rush. In the 1870s and 1880s many of these workers headed toward the coast and the mild climate of the San Francisco Bay.

Fed by the silt-laden waters of the Sacramento-San Joaquin River Delta, the San Francisco Bay offered a diversity of marine resources, including the delicious California bay shrimp. Saltgrass around the bay supported huge populations of these creatures in the mid-1800s.

Many Chinese in California hailed from the Pearl River Delta, where shrimping was a well-established industry; the new settlers used the same skills to duplicate their success in Northern California. Chinese immigrants settled in numerous “shrimp camps” on San Francisco and San Pablo bays. China Camp, on the shores of San Pablo Bay directly across from the delta in an area of extensive mudflats, saltgrass, and pickleweed, was the largest of these camps, with 500 residents at its peak.

Like Bodie, China Camp consisted mainly of men. The camp provided a few services and shops, including a marine supply store. Shrimpers in China Camp coordinated their efforts by circling their boats close together; they ate, drank tea, and relaxed as a group as the tide swept shrimp into nets set in tidal mudflats. These shrimpers pulled in large catches thanks to their special bag nets. Initially they dried most of the catch and sent it back to China. By 1885 the fishermen were bringing in more than 500,000 pounds of shrimp for export and local consumption.

Part 2: The Wild West

Bodie's Bust

The gold in Bodie lasted only a few years. After peaking in mid-1880 at about 7,000, the population dropped to 3,000 by 1882, when several mining companies went bankrupt. An earthquake made a major mine inaccessible and the miners decided it would be too difficult and expensive to relocate. With the town's only industry fading, people went elsewhere for opportunities.

The town lingered on as a few citizens tried to make a simple living off the land. But a harsh winter from 1878 to 1879 claimed hundreds of lives from exposure, disease, and a gunpowder explosion. A major fire in 1937 all but leveled what remained of the town.

Mining continued on a smaller scale until 1942, when a new law passed and limited

mining to endeavors that aided the war effort. Bodie had to be self-reliant to survive, so when the town could no longer tap its minerals for profit the population dwindled to a few families. The last family left in 1962. Because Bodie was so remote, residents found it nearly impossible to bring their belongings with them when they left. Many of these items remain in Bodie today, forming a well-preserved ghost town full of artifacts now protected as Bodie State Historic Park.

Crash at China Camp

As demand for bay shrimp grew locally, so did discontent with the success of the Chinese. The anti-Chinese sentiment from the established fishing industry stemmed partly from the bust following the gold rush.



Bodie State Park



Shrimp boat at China Camp

Unemployed miners traveled to San Francisco looking for ways to live off the land; with little work to go around, non-Chinese fishermen pressured the government to weaken the competition.

People began blaming the bay's degrading ecosystem on habitat damage caused by the Chinese shrimpers. Pressure led to prohibitive new laws that required special licenses, limited the fishing season, outlawed traditional Chinese fishing techniques, prohibited export, and restricted catch size.

By blaming the Chinese for the bay's decline, legislators overlooked other possible causes, such as the disposal of untreated sewage and the diversion of fresh water by cities. The outlawing of bag nets in 1911 proved the final blow to the Chinese shrimping industry. Eventually only one family-run company remained at China Camp. That family sold the town to California Department of Parks and Recreation in 1976; what remains can be visited at China Camp State Park.

Boom and Bust Cycles

Each of these towns provided one plentiful resource, but residents faced different challenges accessing the resources. During Bodie's boom, financing helped overcome tough physical geography to mine a wealth of minerals. The town went bust when a natural disaster cut off its main way to access these minerals. China Camp boomed because the settlers matched their rich fishing know-how with abundant bay resources. The bust came when social and political pressures kept the shrimpers from using their skills at a time when pollution and other factors increasingly impacted the bay's resources.

To survive over the long term, a community needs steady access to a variety of resources. Both China Camp and Bodie depended so heavily on a single resource that they could not survive when that resource declined or became inaccessible. This problem is typical of many economies based on natural resources.

Name: _____

1. Select a California town, either Bodie or China Camp, to describe in the left column. Describe the Maya City of Copan in the right column. In each box describe the factors (landforms, climate, resources, and resource use) that brought people to the town or city.

City: Bodie or China Camp (circle one)	City: Copan
Boom	Boom
Landform	Landform
Climate	Climate
Resources	Resources
Resource Use	Resource Use
Bust	Bust
Landform	Landform
Climate	Climate

Name: _____

City: Bodie or China Camp (circle one)	City: Copan
Resources	Resources
Resource Use	Resource Use
Social factors that impacted resource use	Social factors that impacted resource use

2. Name three renewable and three nonrenewable resources discussed in these stories.

3. Describe one way that resources influenced the growth of **one** of these cities: Bodie, China Camp or Copan.

4. How were Bodie, China Camp, and Copan similar?

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

The Rise and Fall of a Maya City



Maya ball game

Imagine a landscape blanketed in jungle, surrounded by rugged hills topped with pine and oak. This land is one of sun and rain, a region that is wet and warm all year. Rivers tumble from the mountains, eroding the hillsides into flat valleys filled with deep soils. Here in northern Central America, people settled and began farming the rich land as early as 1400 BCE (Before Common Era). People grew corn, beans, peppers, and other products with the ample rain and sunshine. They lived simple lives in small villages.

This way of life changed in 426 CE (Common Era), when a lord invaded the valley and founded the city of Copan. He erected temples, palaces, and monuments. The mountains around the city consisted of stone that was perfect for carving. As the city grew,

artists created some of the most impressive public monuments in the Maya world. The monuments included a staircase covered in sculpted hieroglyphic writing.

By 600 CE, Copan had become a prospering and powerful city and had established outlying colonies. The most important was Quiriguá, located in the only valley in the Americas that contained the precious stone jade. At the height of its influence, Copan was a bustling city. More than 25,000 people farmed the rich valley. They traded nonrenewable resources such as jade and volcanic rock, as well as renewable resources such as shell, wood, and cacao (the beans from which chocolate is made).

This major city was connected to locations thousands of miles away, via mountains that

The Rise and Fall of a Maya City

Lesson 1 Activity Master | page 2 of 2

provided obsidian (a volcanic glass used to make knives and other sharp tools), gold mines, and salt works.

Thousands of peasants supported their own families and several hundred nobles. The nobles lived in palaces that included scribes, priests, and artists. They oversaw public projects, formed and broke alliances with neighboring cities, and offered prayers for the community's well being.

Standing on top of a brightly painted temple in Copan in 700 CE, you would have looked over a vast, bustling city. Below, markets were filled with food, gold, jade, cacao, and feathers. As you looked into the distance, you would have seen thousands of thatched homes surrounded by fields where farmers busily tended corn and beans. This land was truly a place of plenty.

When John Lloyd Stephens, one of the first outsiders to visit Copan, first glimpsed the city in 1839, he mused about the ruins:

"It lay before us like a shattered bark in the midst of the ocean, her masts gone, her name effaced, her crew perished, and none to tell whence she came, to whom she belonged, how long on her voyage, or what caused her destruction; her lost people to be traced only by some fancied resemblance in the construction of the vessel, and, perhaps never to be known at all." (Incidents of Travel in Chiapas, Central America, and Yucatan, 1841)

Looking over this prosperous center in 700 CE, nobody would have guessed it would be completely abandoned in just more than 200 years.

The first blow came in 738 CE when Copan's king was seized and killed during a state visit to the nearby city of Quiriguá.



Maya village

Over the next hundred years, various relatives and other nobles tried to take the throne and did so for short periods of time, but by 822 CE there was no longer any royal presence in Copan. Without a clear ruler to lead the people, the city began to break down. Trade networks and alliances were abandoned, laws were not enforced, and religious and political order ceased to exist and bring the large population together.

Due to its location in an enclosed valley, Copan had limited land for farming. At one time the valley was mostly forested, but by this time that forest had all been cut down. The whole valley bottom was cultivated and its fertility began to decline with increasingly intensive use. Farmers tried to grow more food on their land by putting in more crops in smaller areas. Despite these efforts, production dropped, facilitated by a long drought that lasted for many years.




With less productive land and less access to goods from other cities, people began to leave the area. By 950 CE, Copan had only half of the population that had lived there 200 years earlier. Copan was completely abandoned by 1300 CE, leaving the once glorious temples and palaces to be enveloped by tropical forest.


Mexico, Central America, and South America




Lesson 2 Activity Master




Name: _____



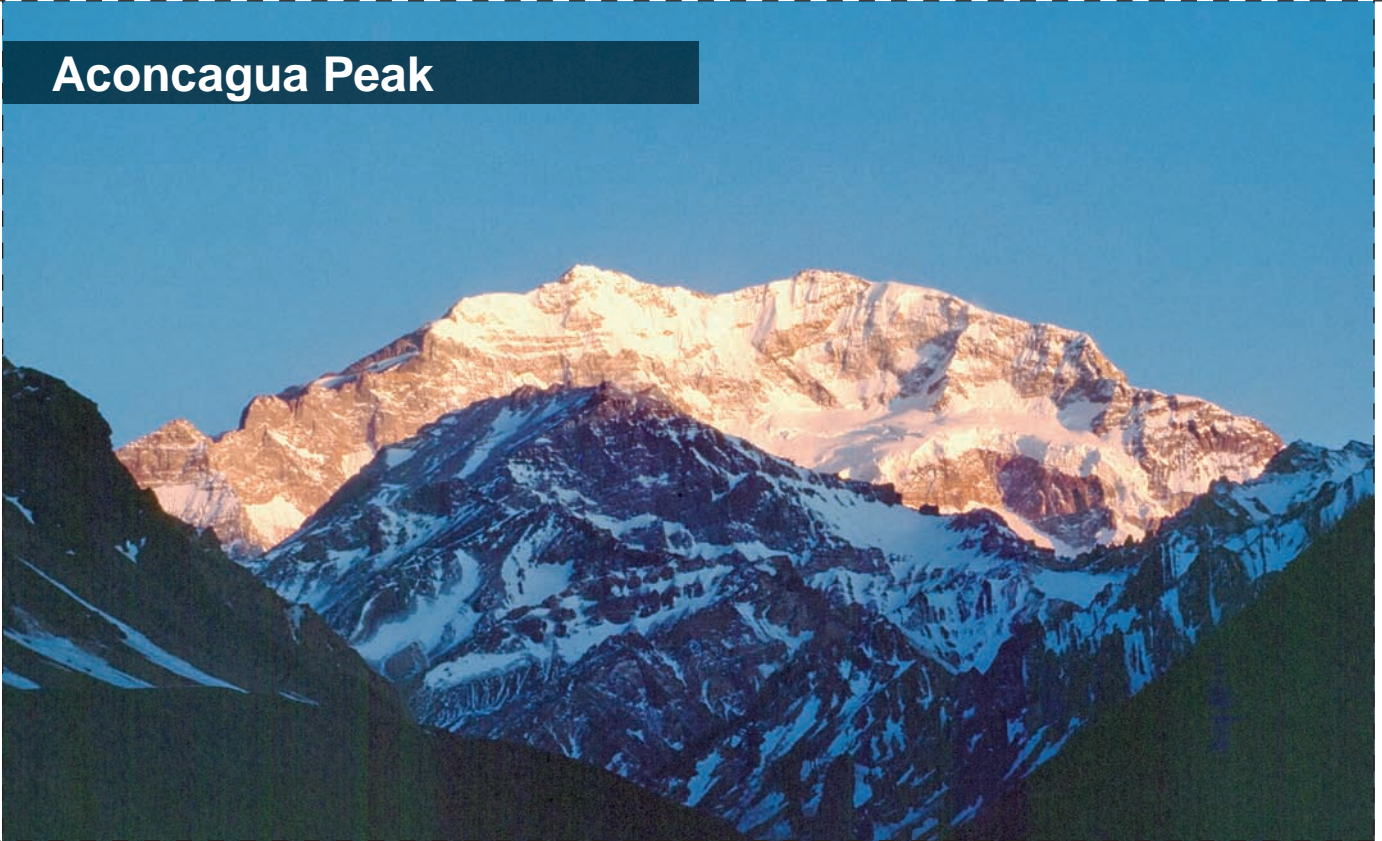
Landform	Description
 <p>Altiplano</p>	<p>This high plateau sits in the central Andes, at 11,000 feet (3,353 meters) above sea level. This area was once covered by a vast inland lake. It is now covered with dense grassland that holds the fragile soil together with deep roots. The grass turns the bright, high-altitude sunshine into energy. Animals such as llamas and alpacas, which produce highly valued meat and wool, eat this grass.</p>
 <p>Amazon Basin</p>	<p>The tributaries of the vast Amazon River run down the eastern side of the Andes. They gather into large rivers that flow slowly across the flat land toward the Atlantic Ocean. Here, the largest rainforest on earth covers almost 2 million square miles. Many plants and animals such as orchids, monkeys, jaguars, tropical birds, and butterflies live here. The Amazon lowlands slow the flow of water running off from the Andes. This change of pace allows the water to slowly meander toward the Atlantic, distributing nutrients throughout the forest.</p>
 <p>Andes Mountains</p>	<p>The peaks of the Andes rise sharply along the edge of western South America. These mountains reach higher than 22,000 feet (6,706 meters). The Andes are dotted with volcanoes with rich soils and valleys with mild climates. The mountains also have many gold and silver deposits. The peaks of the Andes push air upward, cooling it. This cool air condenses into rain that flows down the mountains. Air in the high mountains is so cold and dry that foods such as potatoes can be freeze-dried for long-term storage.</p>

Landform	Description
 <p>Atacama Desert</p>	<p>Bordered by high mountains on one side and ocean on the other, the Atacama is the driest desert in the world. Some places here have gone more than 400 years without any evidence of rainfall. Minerals such as salt and copper are common here. The extremely dry conditions are perfect for preserving things, from foodstuffs to human mummies.</p>
 <p>Belize Barrier Reef</p>	<p>The Belize Barrier Reef is the second largest coral reef in the world. An incredible variety of organisms live here. They include more than 60 species of coral and more than 300 species of fish. The reef breaks rough ocean currents before they hit the shore. This barrier protects coastal villages from rough water and storm surges. Along the reef, many small islands provide places where ocean water can be evaporated to extract salt. Edible fish and conch that live in the reef can be dried for long-distance transport.</p>
 <p>Caribbean Sea</p>	<p>The clear waters of the Caribbean Sea support some of the most diverse marine communities in the world. These communities include coral reefs, seagrass beds, and mangrove swamps. Fish, brightly colored shells, and coral offer food and other resources for people. The warm water here evaporates into the air. This evaporation increases the rainfall along coasts and powers storms that grow into huge hurricanes.</p>

Landform	Description
 <p>Humboldt Current</p>	<p>The cold Humboldt Current sweeps north from Antarctica along the Pacific coast of South America. Nutrient-rich sediments rise upward in the water offshore through upwelling. This shift in the water layers creates one of the most productive marine systems in the world. Here, people harvest tons of anchovies, sardines, tuna, and other fish.</p>
 <p>Lake Texcoco</p>	<p>This inland lake is formed by a number of rivers that flow into a basin surrounded by volcanoes. Vegetation falls into the lake and rots at the bottom, adding nutrients to the soil. Rich sediment and a permanent supply of water make it an ideal location for agriculture. People created raised gardens called <i>chinampas</i> in shallow parts of the lake. Much of Mexico City sits on the drained and filled remains of Lake Texcoco; however, some areas continue to be agriculturally productive, including the chinampa gardens of Xochimilco.</p>
 <p>Lake Titicaca</p>	<p>Lake Titicaca is one of the highest lakes in the world. It is fed by water from numerous mountain streams that carry rich soil from surrounding volcanic peaks. Lake Titicaca provides a source of fresh water in the dry Altiplano. Reeds that grow in the lake are so thick that people make them into artificial islands, upon which they still build whole villages.</p>

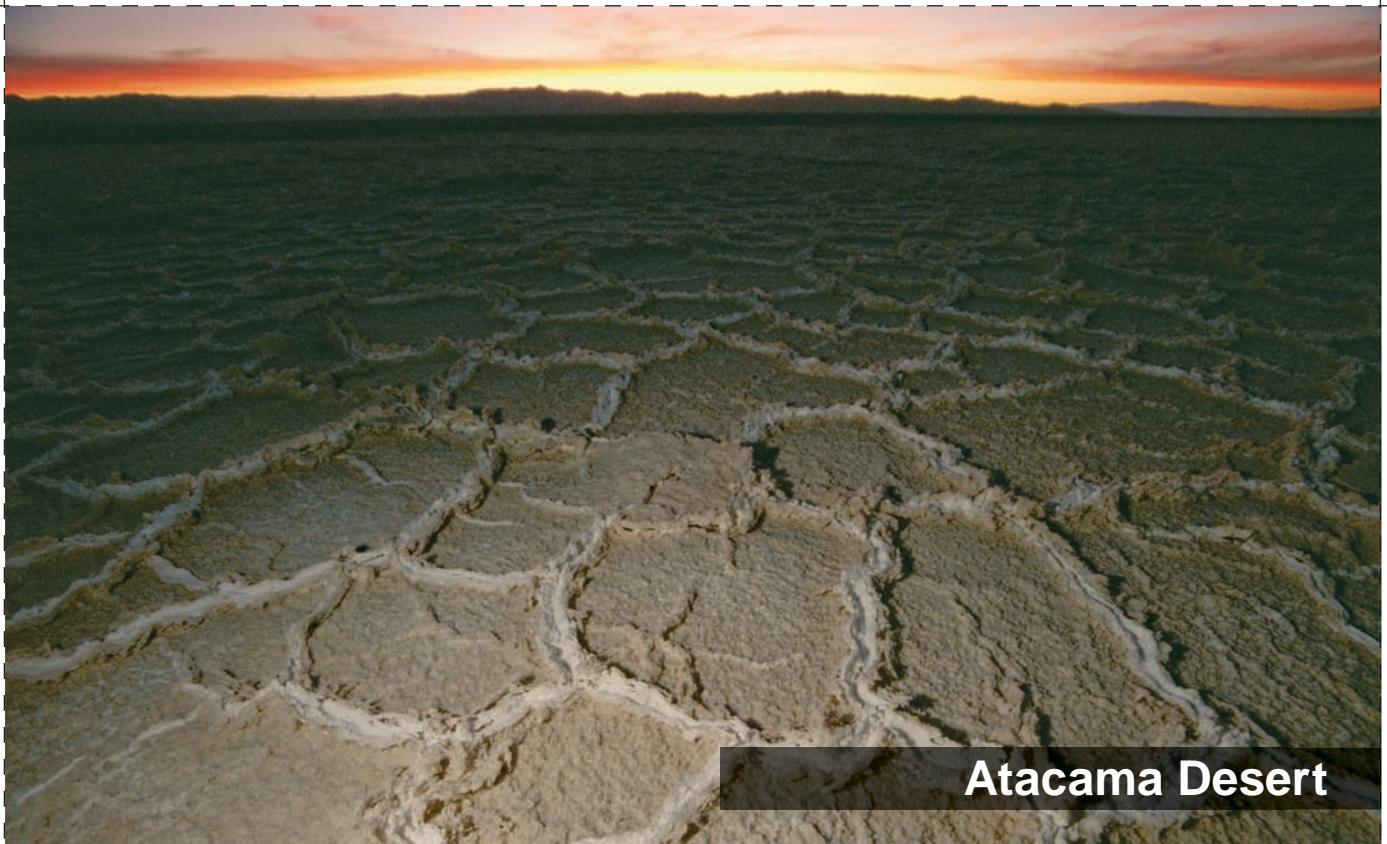
Landform	Description
 <p>Motagua Valley</p>	<p>This valley is located where the Caribbean and North American tectonic plates meet. It is the only place in the Americas where the valuable gemstone jade occurs. This hard green stone was polished into jewelry, masks, and important ceremonial objects. Water from the highlands of Guatemala ran through this valley in permanent rivers. These watered crops, brought rich volcanic soils to the lowlands, and provided travel routes for trade.</p>
 <p>Sierra Madre</p>	<p>The peaks of the Sierra Madre support some of the richest and most diverse natural systems in the world. A high valley divides these peaks into two ranges. The Sierra Madre Occidental is on the west. The Sierra Madre Oriental is to the east. These volcanic mountains help to push air upward over Mexico. This effect on air pressure creates rain that sustains lush vegetation toward the southern part of the range. Active volcanoes shower nutrient-rich ash on valleys below, building some of most productive soils in the world. The hard mountains reach beneath the soft soil, creating aquifers that come to the surface as freshwater springs.</p>
 <p>Yucatán Peninsula</p>	<p>This flat area was once seafloor and is made of limestone. The limestone neutralizes acid from plant decomposition in the forest, resulting in unusually rich tropical soils. Limestone erodes easily, forming wells called cenotes that provide access to fresh water. Limestone provides an important building material for people. It can be carved into large blocks and burned to make cement. Burnt limestone added to cornmeal keeps tortillas soft and flexible.</p>

Aconcagua Peak



Amazon Basin



**Atacama Desert****Belize Barrier Reef**

Popocatepetl Volcano



Lake Titicaca



Altiplano



Altiplano Fact Card

Landform



Altiplano

Description

This high plateau sits in the central Andes, at 11,000 feet (3,353 meters) above sea level. This area was once covered by a vast inland lake. It is now covered with dense grassland that holds the fragile soil together with deep roots. The grass turns the bright, high-altitude sunshine into energy. Animals such as llamas and alpacas, which produce highly valued meat and wool, eat this grass.

Political Boundaries of Latin America



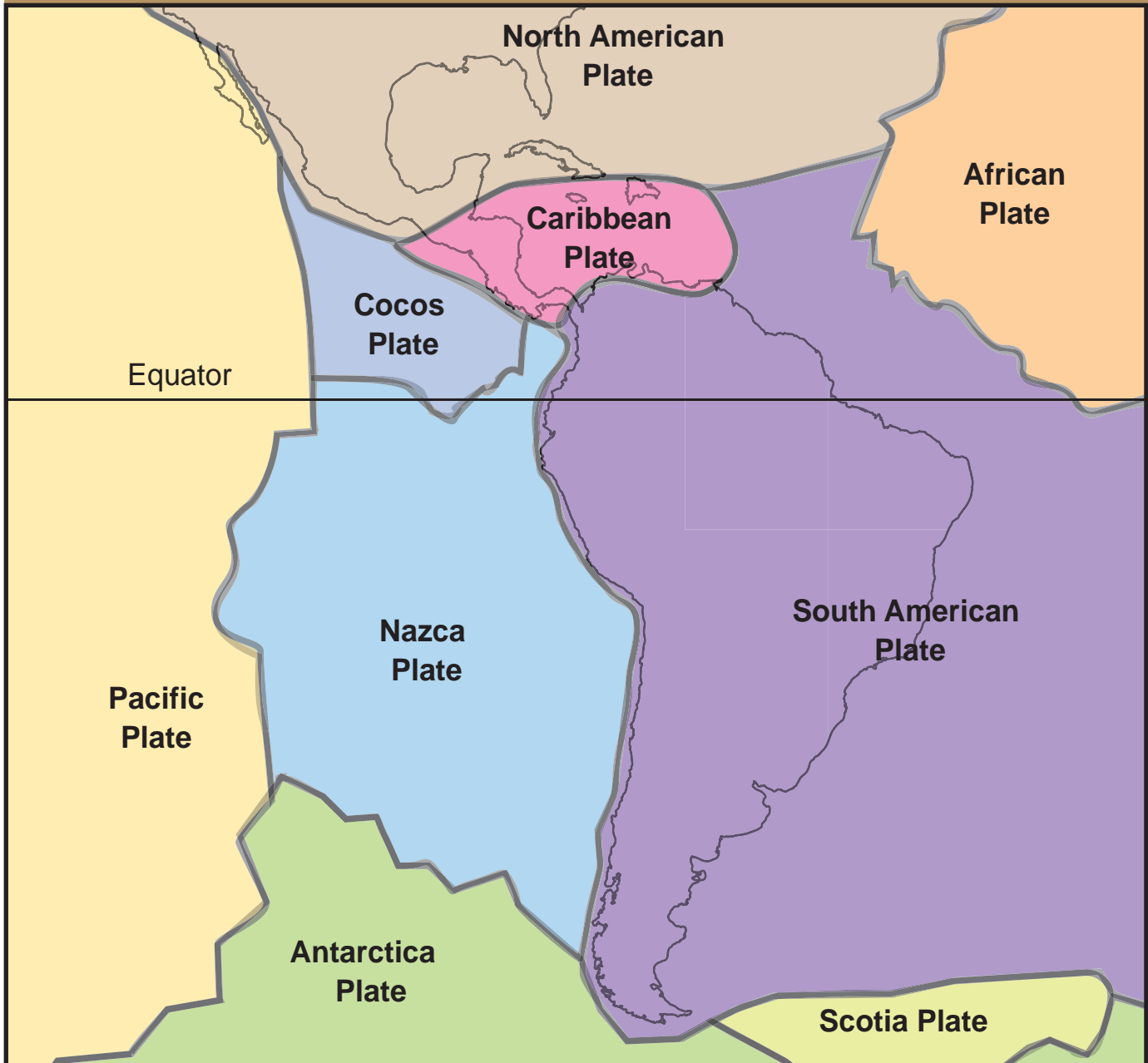
Mexico, Central America, and South America



Satellite Image of Latin America



Tectonic Plate Boundaries of Latin America



Name: _____

Instructions:

- Insert the following on the map: Equator, Tropic of Cancer, and Tropic of Capricorn.
- Use the map key provided on the transparency Latin American Climates as a guide as you identify and color the various Latin American climates.
- Complete the Climate Types Map Key.



Tropical Climates: 0°– 30° Latitude

Tropical, Wet

These areas are wet all year. They receive at least two inches (60 millimeters) of rain per month and up to 260 inches (600 centimeters) per year. Temperatures are always warm at 64°F (18°C) or higher. This climate supports tropical rainforests and occurs over the Amazon Basin in central Brazil, eastern Colombia, Peru, Ecuador, and Bolivia. This climate also exists in the forests on the Caribbean side of Central America.



Rainforest

Tropical, Wet, and Dry

These areas have a dry season during the winter months. During the driest month fewer than two inches (60 millimeters) of rain fall, with a maximum of 20–70 inches (50–175 centimeters) of rainfall throughout the year. Seasonally flooded grasslands or dry forests occur in areas with this climate type. This climate type is one of the most common in Latin America. It covers a large portion of Bolivia, Venezuela, Colombia, and southern Brazil. It also occurs in most of Southern Mexico and along the Pacific coast of Central America.

Semi-Arid

These areas tend to be grasslands. Between 10 and 20 inches (25–50 centimeters) of rain falls in this climate type per year with only slight variation in daily temperatures. The pampas of central Argentina, the grasslands of central Mexico, and northern Venezuela all experience this climate type.

Arid

Fewer than 10 inches (25 centimeters) of rain fall in arid climate types each year. This climate type sees a wide variation in daily temperatures, with differences between day and night ranging over 50°F (10°C) or more. Deserts form along the Pacific coast from central Chile to Ecuador. They also develop in southern Argentina and northern Mexico.



Arid

Mid-Latitude Climates: 30°– 60° Latitude

Humid Temperate

These areas have distinct seasons with cold, dry winters and warm, wet summers. Most of the eastern United States has this climate type, which also occurs in Uruguay, Paraguay, and most of Argentina. Approximately 32 inches (81 centimeters) of precipitation falls here each year. Temperatures range from higher than 90°F (18°C) in the summer to below freezing in winter.

Mediterranean

Summers in these areas are hot and dry and winters mild and wet. Approximately 17 inches (42 centimeters) of rain falls here each year. Temperatures range from near freezing in the winter to higher than 90°F (32°C) in summer. This climate type occurs across much of California. In South America it occurs only along the central coast of Chile, near Santiago.

Marine West Coast

This climate occurs where cold ocean currents run along the coast. This pattern creates relatively mild temperatures that average around 60°F (16°C) and holds moisture year-round. As many as 100 inches (125 centimeters) of rain falls here per year, with most of the rain falling in winter. California's coast redwood forests occur in this climate. In Latin America, this climate spans the southern coast of Chile.

Polar Climates: 60°+ Latitude

Tundra

The tundra experiences a cool climate, ranging from 10°F to 50°F (-12°C to 10°C). Only a small amount of precipitation, 20 inches (50.8 centimeters) or fewer, falls here each year. This climate occurs at the very southern tip of South America.

Any Latitude

Montane

Montane areas see a wide diversity of different climates over a small area. This climate occurs in the Andes that run along the length of western South America and in the Sierra Madre that rings central Mexico.



Montane

Climate Visualization

Close your eyes. You are about to embark on a journey that will take you through some of the most incredible landscapes on Earth. So relax and get ready for the trip of lifetime. Take a deep breath and feel your body slowly floating upward. You are moving south along the rugged coastline. South from California all the way to South America, to the equator itself.

Breathe through your nostrils and smell the salt air. Now you are on the cool Pacific coastline of Ecuador. Behind you, across hundreds of miles of open ocean, are the islands of the Galapagos. In front of you is a rocky shore battered by waves. Here, the warm Panama Current meets the freezing cold waters of the Humboldt Current, which sweep north from Antarctica. This meeting of the currents creates a rich marine environment teeming with fish. You packed a fishing pole, so you take a while to sit on the cliffs and angle for a bite. Luckily, you brought a full water bottle. Fewer than 29 inches (50 centimeters) of rain fall here over the entire year. As you sit, you keep your sweatshirt on; the temperatures are cool along the ocean as they hover around 65°F (18°C).

You pull off your sweatshirt as you travel slightly further inland. Dry grass rustles underfoot and many of the trees here are leafless. You are in the dry forest of the Ecuadorian coast. You take a drink from your water bottle. Only 20 to 40 inches (51 to 102 centimeters) of rain fall in this region and most of it drops during the rainy season (from June through October). You're beginning to sweat, since it is over 90°F (32°C) during the day here for most of the year; it drops to 70°F (21°C) at night.

Time to get to somewhere cooler and you know just where to go. In front of you, you see the towering peaks of the Andes, the second highest mountain range in the world. As you start up the mountains, things change quickly. The air gets cooler and wetter. The dry forest gives way to green ferns and waterfalls. At just about 5,000 feet (1,524 meters) above sea level, you see fields of corn and coffee all around you. You pull out your umbrella as an afternoon storm starts. There's a moderate amount of rainfall here, about 20 to 100 inches (51 to 254 centimeters). Right now it's still pleasant, about 75°F (24°C). But you are glad you brought a jacket, because it will drop below 50°F (10°C) tonight. The mild temperatures and year-round rain here make it a perfect place for people to live, a land of eternal spring.

As nice as it is in these green valleys, you cannot resist going up toward the snow-covered peaks in front of you. As you go higher, the forests get thinner and thinner. You walk among thick bunches of grass, where herds of furry alpacas graze in the bright sunlight. Here in the Andean Altiplano (ahl-tea-plah-no) temperatures stay cool all year-round, at an average of 45°F (7°C). It is harder for you to hike up here at 10,000 feet (3,048 meters), because there is less oxygen

*Snowy mountain*

in the crisp air. You put on your hat and stuff your hands into your pockets to warm them.

You continue even higher, until all vegetation disappears, and snow and ice crunch under your feet. You are now higher than 16,000 feet (4,877 meters), on the glaciers that cover the high Andes. You pull down the earflaps on your hat and wrap a scarf around your neck—the dry, freezing cold air whips over the mountains and makes you shiver. It is the frigid conditions here that preserved Inca mummies for hundreds of years on these high peaks. You look out to see nothing but vast, sharp, white and gray mountains all around. Here, any moisture still left in the clouds gathers as ice or snow and temperatures stay below freezing all day. You cannot believe it is so cold here right on the equator. To think that before this trip you thought tropical places were all hot!

You see a huge bird circling overhead—it is an Andean condor—and with it you plunge

over to the eastern side of the mountains. You fly over grassy altiplano and see misty wet forests covering the slopes below. As you drop to lower than 2,000 feet (610 meters) in elevation, you see that the eastern side of the mountains is different from the dry western coast. Flocks of red and blue squawking macaws fly over what looks to be an endless forest, and below you hear the calls of monkeys and smell the sweet aroma of orchids. You are now in the headwaters of the Amazon, where it rains almost daily, up to 250 inches (6 meters) per year. The combination of moist air and tropical latitude means it is as warm at night as it is during the day, about 80°F (27°C).

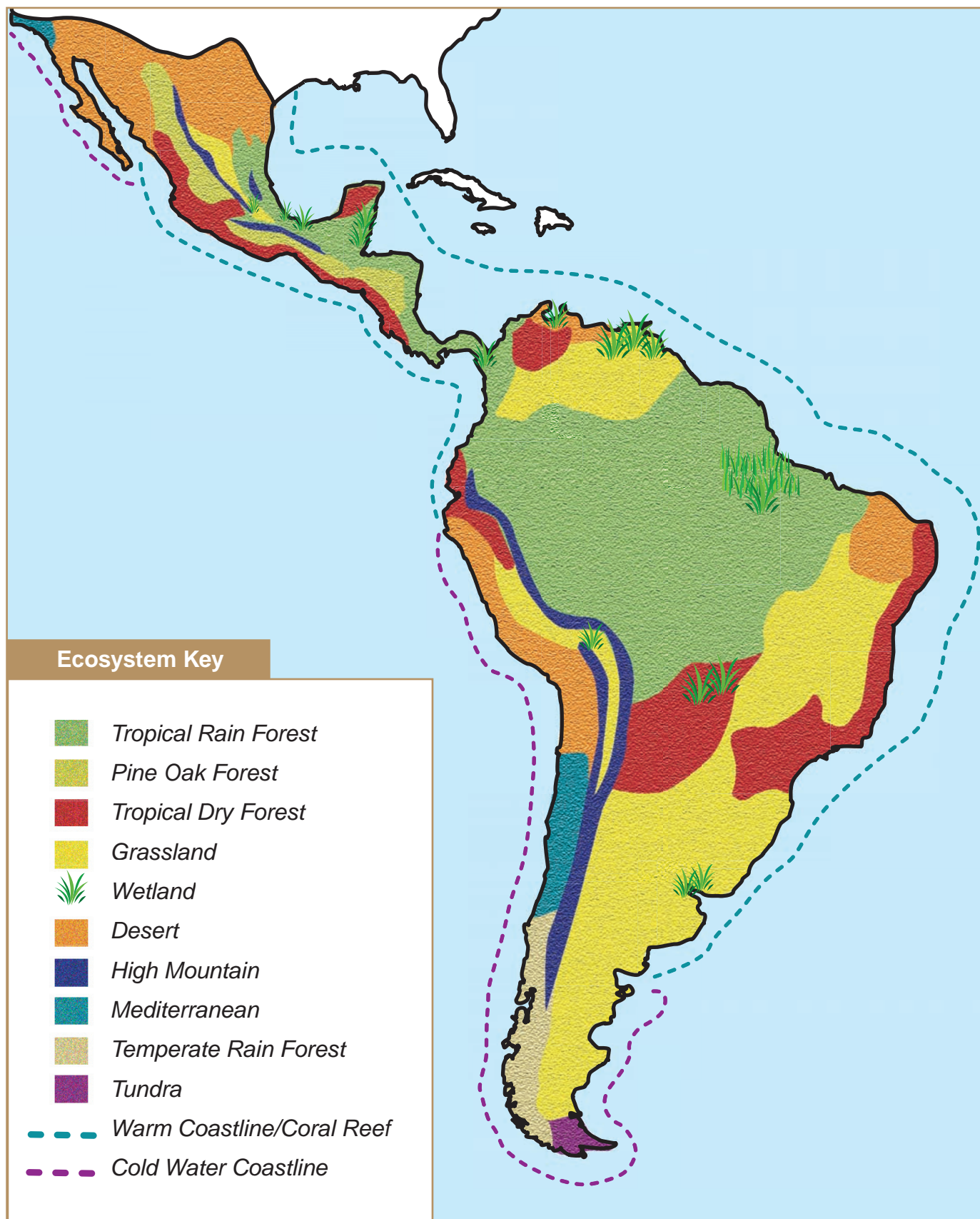
Now it is time for your journey to end. Nobody at home will believe all of the different climates you have seen over just 250 miles (402 kilometers). That is less than the distance between Monterey and Los Angeles.

Latin American Climates



Latin American Ecosystems

Lesson 4 Activity Master



Lesson 4 Activity Master

- | Ecosystem Good | Ecosystem |
|----------------------|----------------------------|
| a. copal resin | _____ coastline/coral reef |
| b. colorful feathers | _____ wetland |
| c. reeds | _____ desert |
| d. cochineal insects | _____ pine-oak forest |
| e. seashells | _____ dry forest |
| f. alpaca wool | _____ tropical rainforest |
| g. fig bark | _____ grassland |

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Parrot feathers

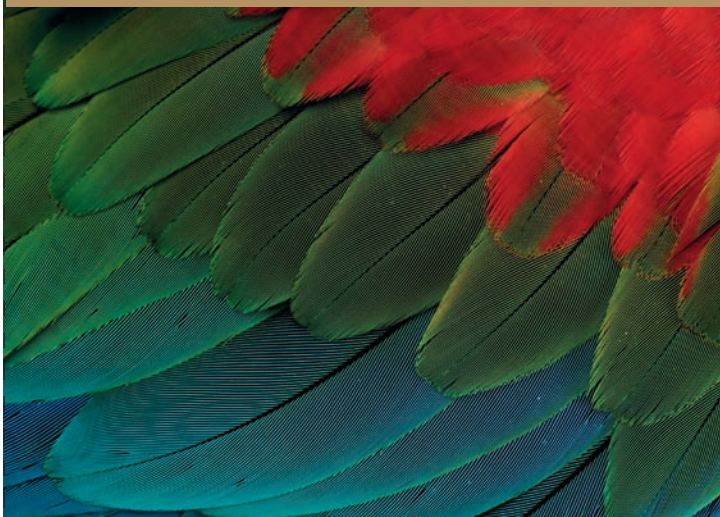


Fig bark



Pacific thorny oyster



Alpaca



Dried copal (tree sap)



Agave



Chimu tunic (ancient Peru)



Nazca artifact (ancient Peru)



Copal incense



Fig bark paper (amate) from Mexico



Modern alpaca wool caps



Agave rope



Latin American Ecosystems



Maya, Inca, and Aztec Regions



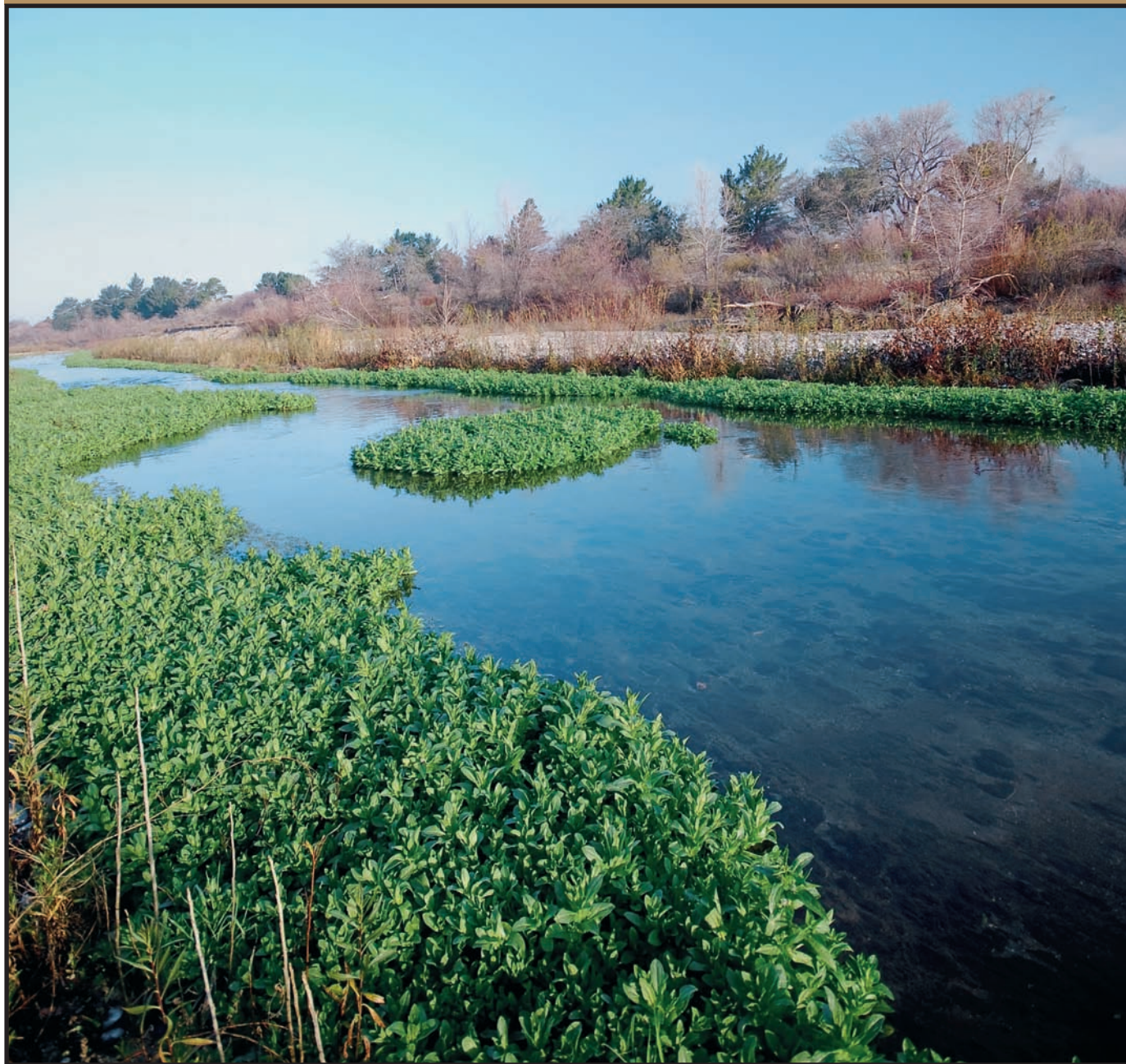
Erosion Prevention



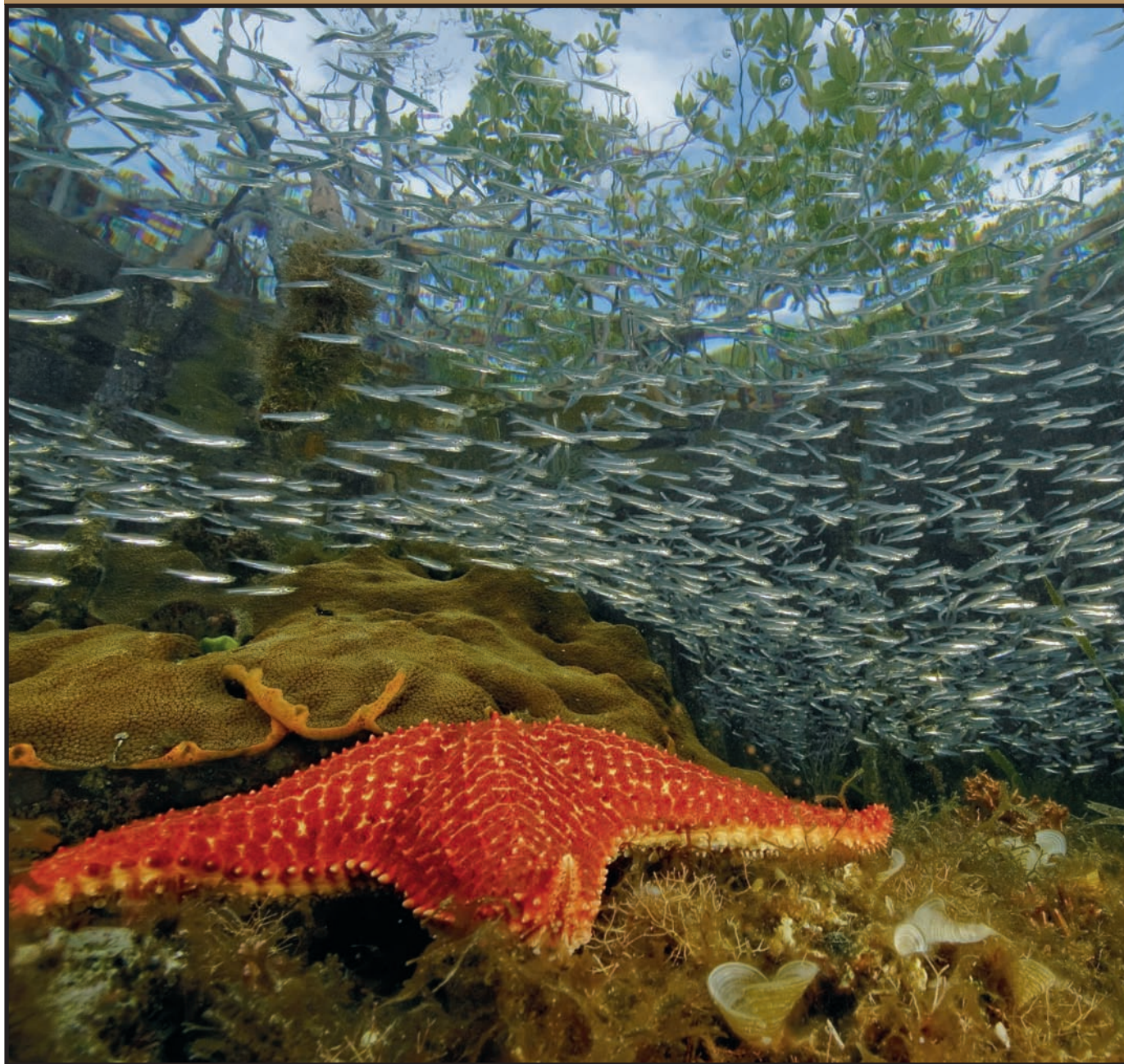
Pollination



Flood Control



Habitat



Aztec Province Glyphs	
Cihuatlan Province	
Tepeyacac Province	
Tochtepec Province	
Xoconochco Province	
Tepequacuilco Province	

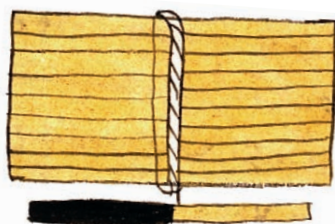
Agricultural Products



Bin of Corn



Bin of Beans
and Amaranth



Tobacco Smoking Sticks



Bundle of Cotton



Bundle of
Dried Chilies



Bundle of
Red Cacao Beans



Bundle of
Brown Cacao Beans








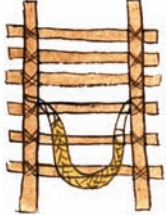


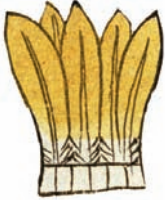
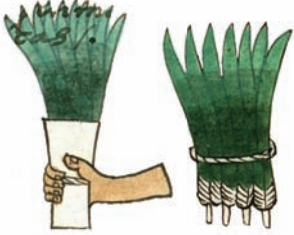





Gourd Box


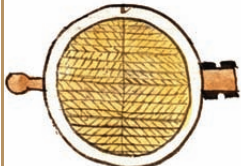






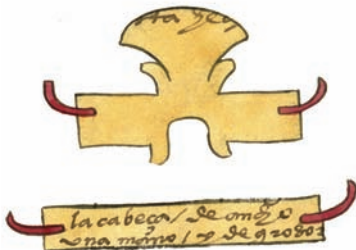




Jar of Honey

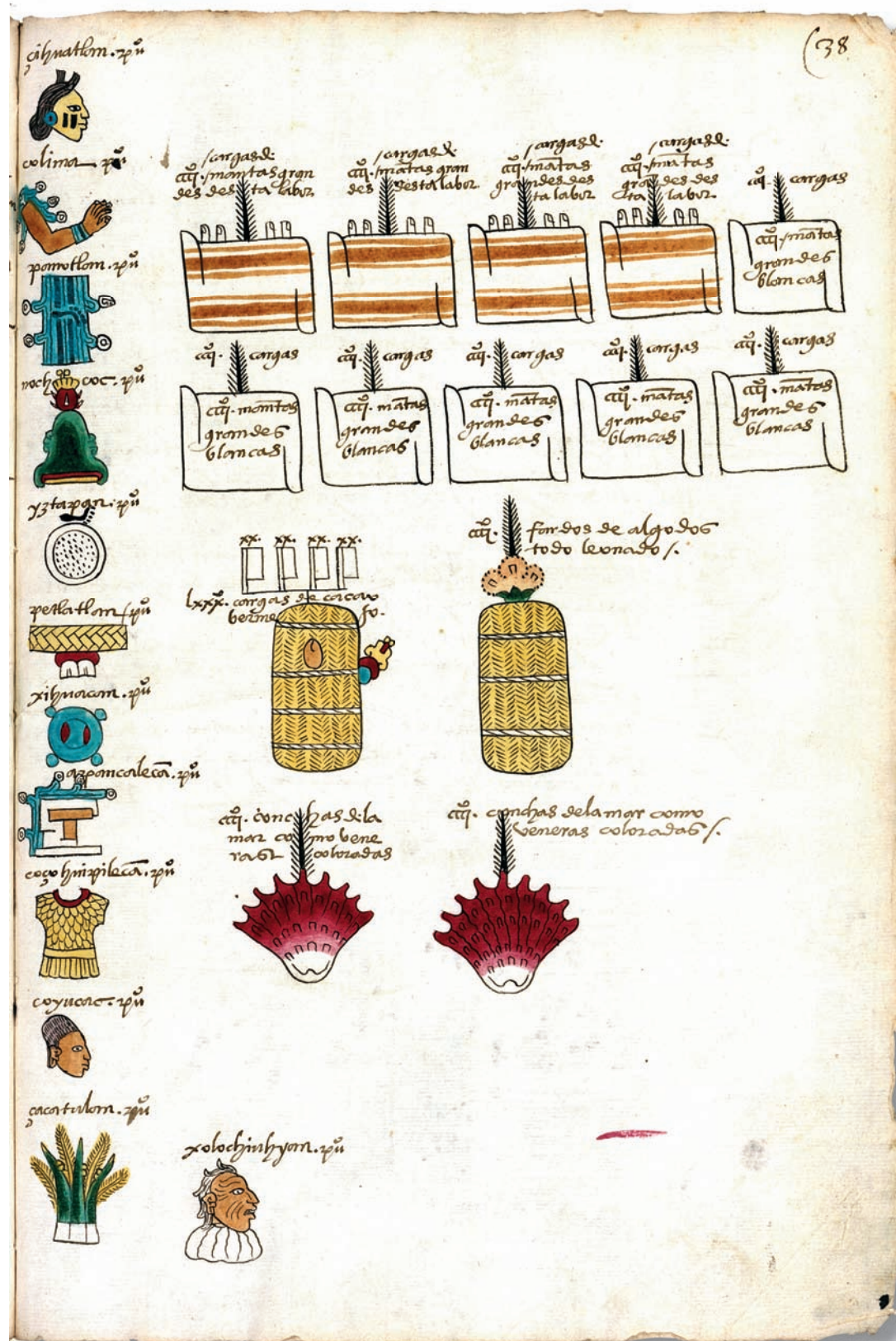


Gourd Bowls for Drinking Cacao

Extracted Natural Products			
			
Red Thorny Oyster Shell	Rubber Ball	Basket of Refined White Copal Incense	Basket of Unrefined Black Copal Incense
			
Pot of Liquidambar Resin (Used for Medicine and Incense)	Wodden Carrying Frame	Bag of Small White Feathers	
			
Little Handful of Feathers	Large Handful of Feathers	Handful of Quetzal Feathers	Large Bundle of Feathers
			
Jaguar Skin	Deer Skin	Cane Sticks	Blue Cotinga Bird Skin

Valuable Rocks and Minerals			
			
Bundle of Lime	Obsidian War Club and Wooden Shield	Copper Axe	Lip Plug of Gold/Precious Stone
			
Amber	Gold Beads	Turquoise Beads	Jade or Greenstone Beads
			
Gold Headbands	Bowl of Gold Dust	Turquoise Plate	

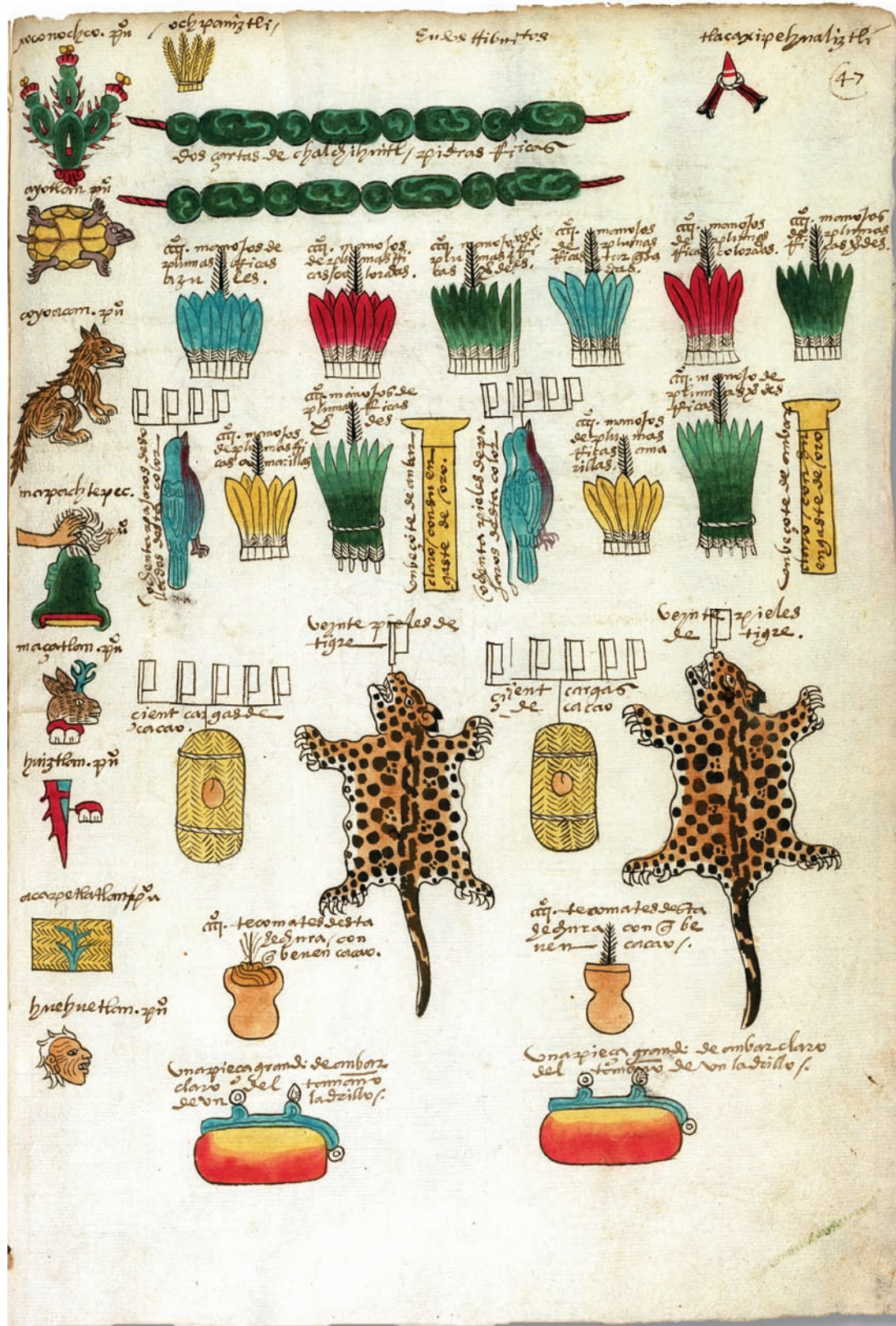
Province 1: Cihuatlán—Place of Many Women



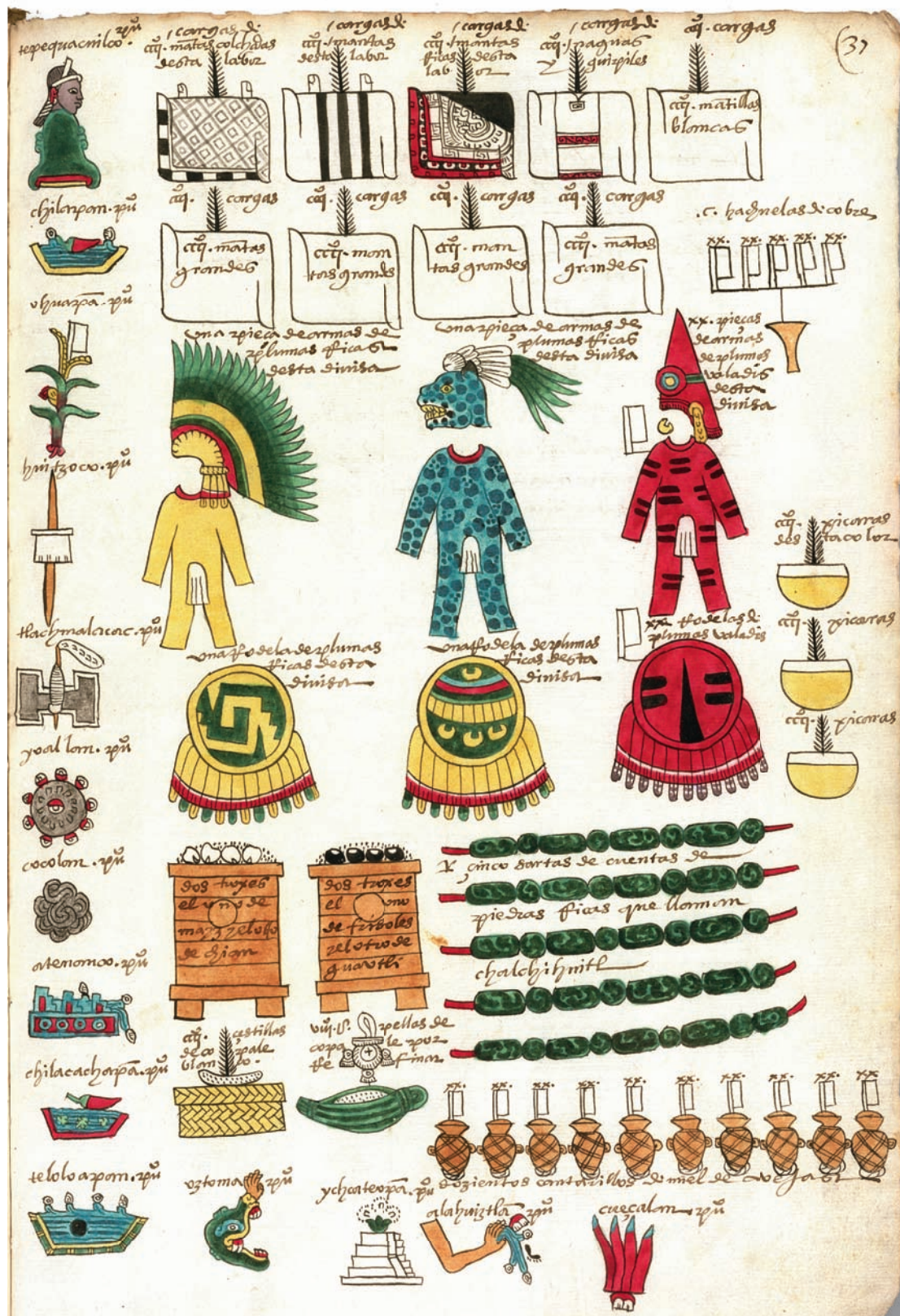
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Province 4: Xoconochco—On the Sour Cactus Fruit



Province 5: Tepecuacuilco—Place Where Faces are Painted



Provinces of the Aztec Empire



Key to Tribute Records

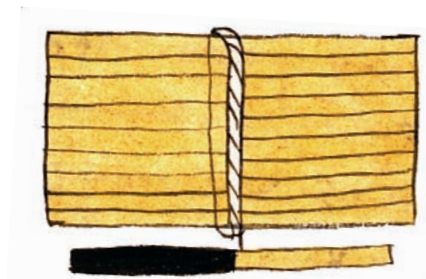
Agricultural Products



Bin of Corn



Bin of Beans
and Amaranth



Tobacco Smoking Sticks

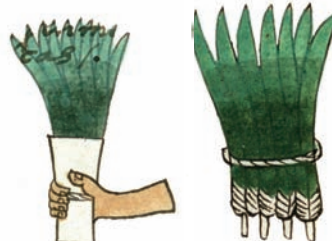
Extracted Natural Products



Little Handfull of Feathers



Large Handful of
Feathers



Handful of
Quetzal Feathers

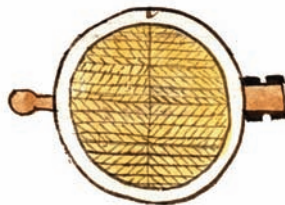


Large Bundle
of Feathers

Valuable Rocks and Minerals



Bundle of Lime



Obsidian War Club
and Wooden Schield



Copper Axe



Lip Plug of
Gold/Precious Stone

Aztec Tribute Items



cotton



cacao beans



amber



quetzal feathers

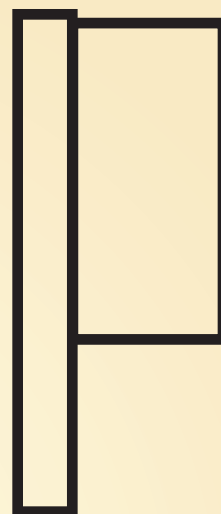
Cihuatlán Province Tribute Record



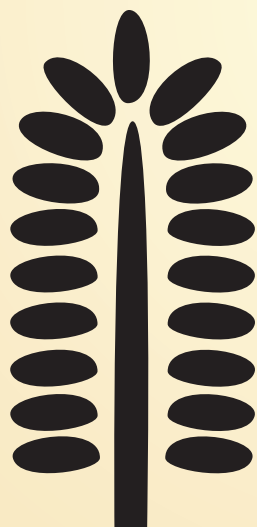
Aztec Numbering System



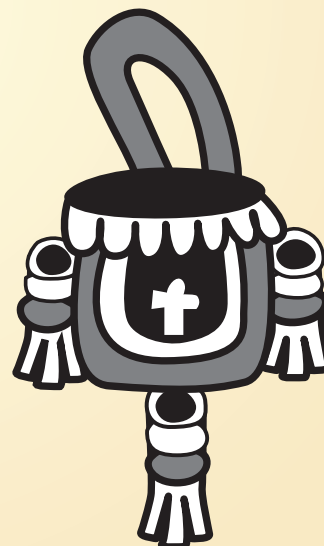
Dots = 1



Flags = 20



Feathers = 400 (20x20)



Incense Pots = 8000 (20x20x20)

Tributes Paid by Five Aztec Provinces

Province 1: Cihuatlán

- 80 bundles of red cacao
- 400 bundles of cotton
- 800 red thorny oyster shells

Province 2: Tepeyacac

- 12,000 bundles of cane
- 4,000 bundles of lime
- 800 deerskins
- 8,000 tobacco smoking sticks
- 200 carrying frames
- 1 bin of corn
- 1 bin of beans

Province 3: Tchtepec

- 2 gold headbands
- 2 of gold beads
- 3 large greenstones
- 7 strings of greenstone beads
- 40 lip plugs
- 4 large bundles of feathers
- 8,000 little handfuls of blue feathers
- 8,000 little handfuls of red feathers
- 8,000 little handfuls of green feathers
- 100 pots of liquidambar resin
- 200 bundles of cacao
- 16,000 balls of rubber

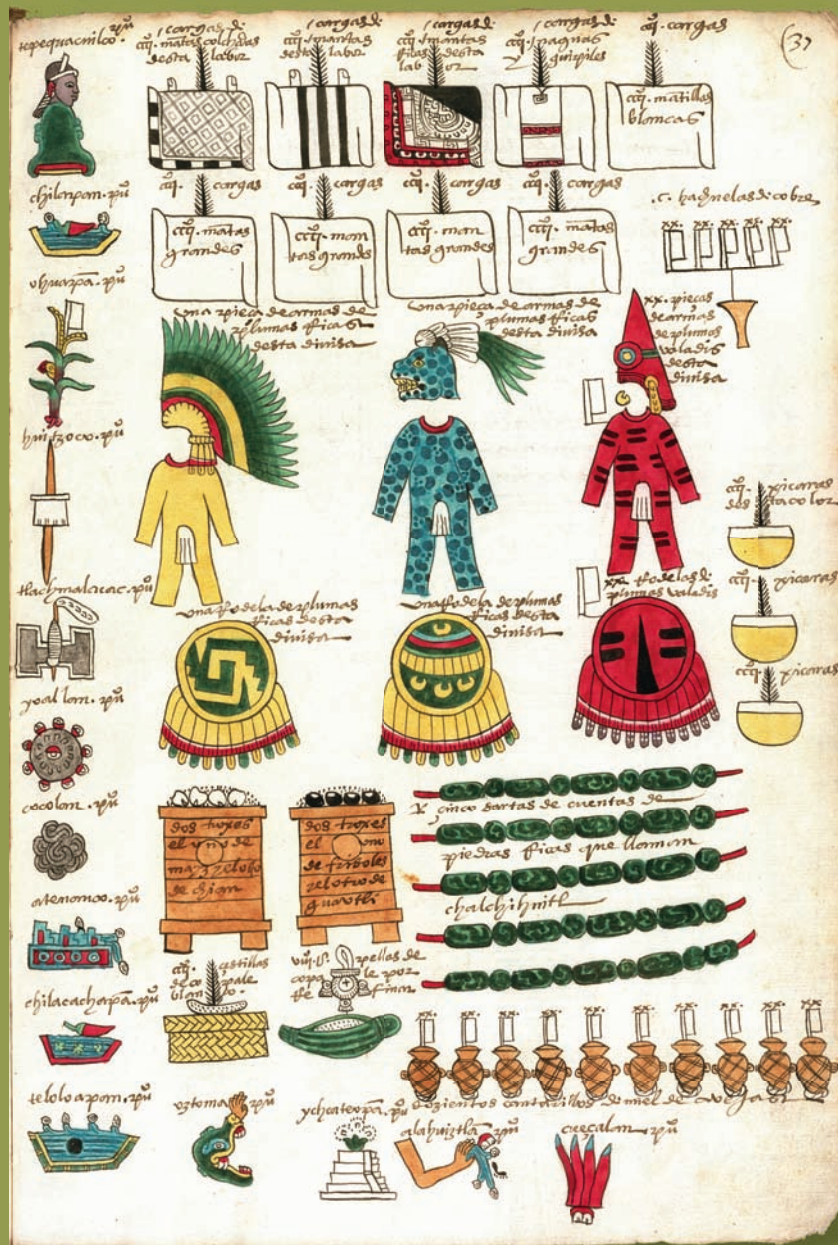
Province 4: Xoconochco

- 2 strings of greenstones
- 800 large handfuls of blue feathers
- 800 large handfuls of red feathers
- 800 large handfuls of green feathers
- 800 large handfuls of yellow feathers
- 160 blue cotinga bird skins
- 800 bundles of quetzal feathers
- 2 lip plugs
- 200 loads of cacao
- 400 jaguar skins
- 800 bowls for drinking cacao
- 2 large pieces of amber

Province 5: Tepecuacuilco

- 100 copper axes
- 1,200 gourd bowls
- 200 jars of honey
- 400 baskets of white copal incense
- 8,000 balls of black copal incense
- 5 strings of greenstones
- 2 bins of corn and chia
- 2 bins of beans and amaranth

Tepecuacuilco Province Tribute Record



Name: _____

Read the background information and discuss it with your partner. Then answer the questions.

Part 1: Inca

Background information:

- The Andes' rugged topography created many different microclimates. As a result, certain crops grew better in some villages than in others.
- The Inca Empire had a socialist system, in which the state controlled the distribution of wealth.
- People who demonstrated special skills in weaving, metallurgy, and record keeping could join royal households, though they would never be true 'Inca' (a hereditary distinction).
- The land that the people lived on was owned by the Inca Empire, so the Sapa Inca (the Emperor) decreed that each village had to focus on producing the crop that grew best in each area.
- The Inca had state storehouses called *quolla* along major roads and outside each village where they collected a portion of each village's crops. The supplies fed the villagers during lean times as well as government workers and soldiers.

Questions (15 points):

1. Who made the decisions about the supply and use of natural resources in the Inca culture?

2. What were the advantages of this decision-making process?

3. What were the disadvantages of this decision-making process?

Name: _____

Part 2: Maya

Background information:

- Each city represents a self-governing state consisting of a city and its surrounding territory.
- Maya farming methods made this group successful in a tropical environment. The Maya cleared dense rainforests; terraced hill sides, built raised fields to convert wetlands for intensive agriculture; and built channels that could be opened to drain excess water.
- Every city could grow corn, beans, cotton, and other basic resources, although some cities grew more than others.
- A few cities had a monopoly on certain items such as salt and jade.
- People in the cities could obtain objects only through trade with other cities, although the Maya would also acquire resources through warfare.

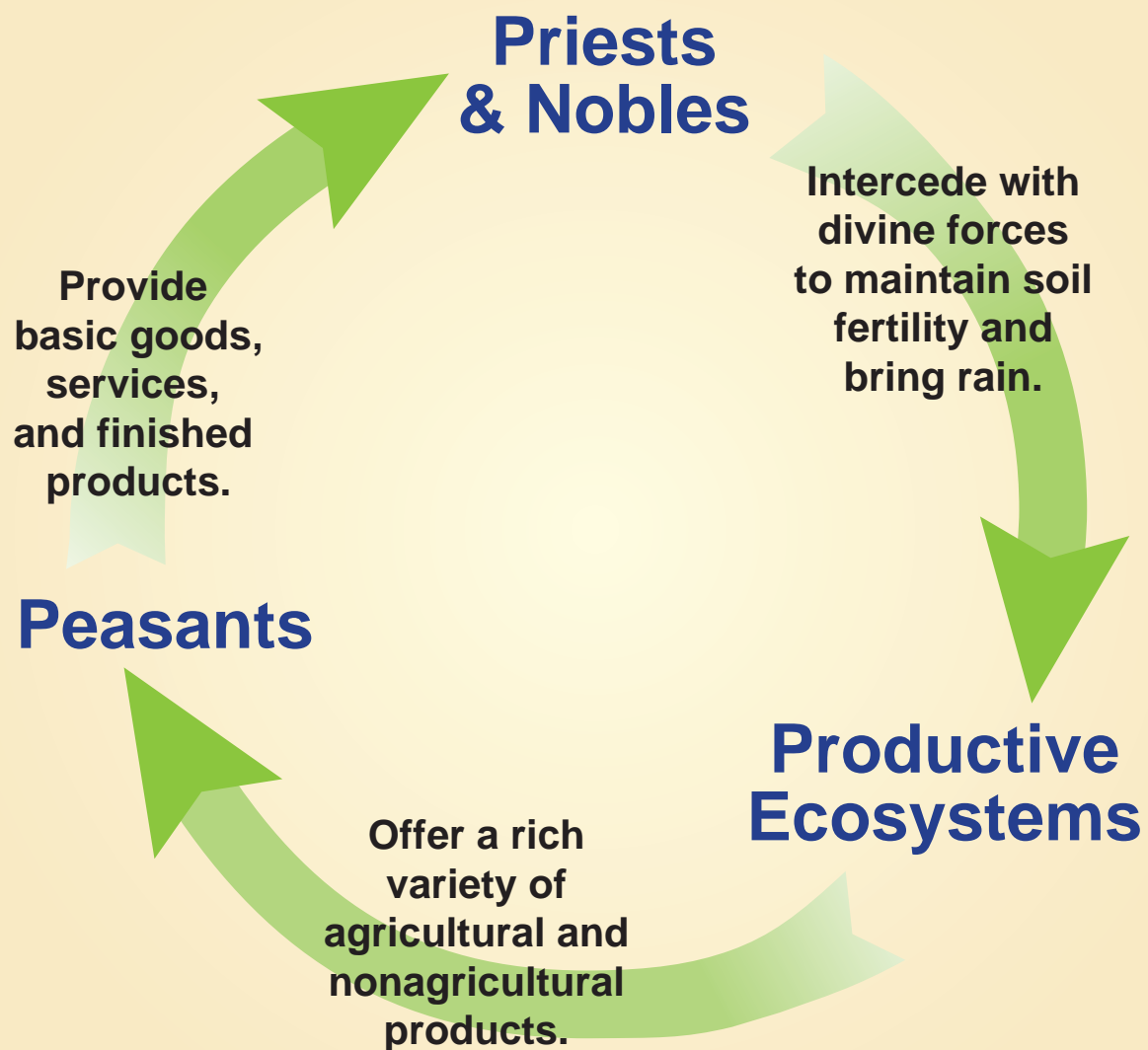
Questions (15 points):

4. Who made the decisions about the supply and use of natural resources in the Maya culture?

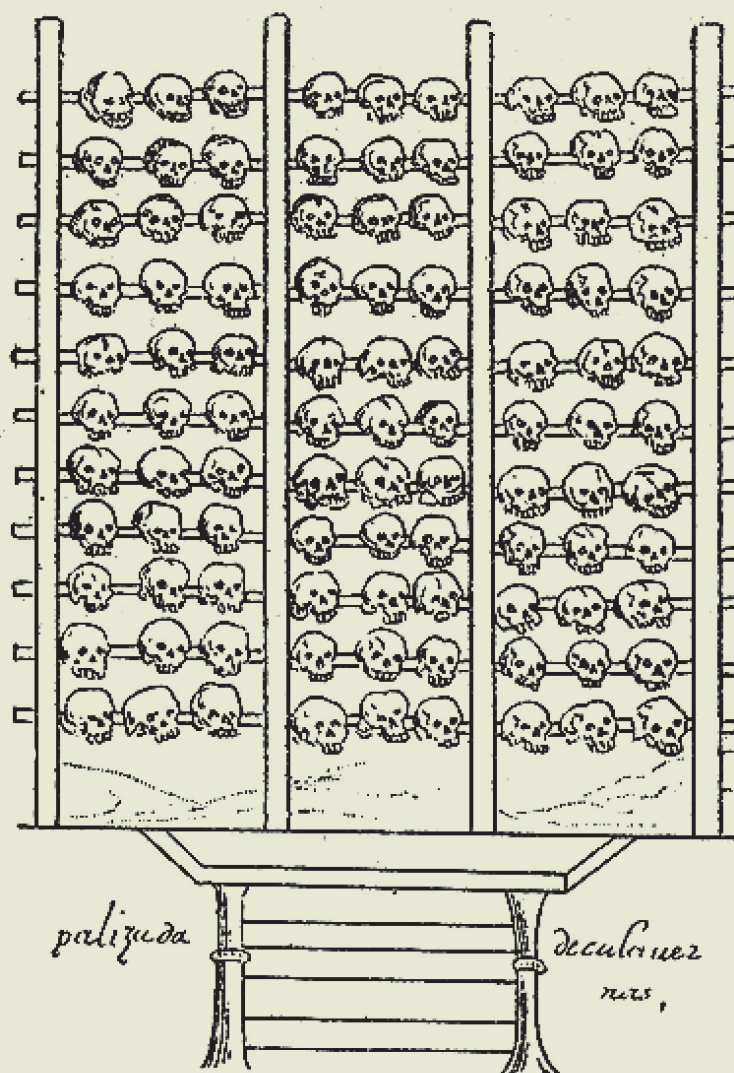
5. What were the advantages of this decision-making process?

6. What were the disadvantages of this decision-making process?

Priests and Nobles, Peasants, and Productive Ecosystems



Tzompantli



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